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Light deflection in the Kaluza-Klein theory in the presence of a vector potential

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Abstract

General expressions - tests for studying light deflection by a massive body, including the classical test of the general relativity theory - are derived based on the reactive and electromagnetic vector potentials in the generalized Gross-Perry and Kerr metrics within the framework of gravitational Kaluza-Klein theory. It is demonstrated that neglect of the electromagnetic potential in the Gross-Perry metric in the presence of the reactive potential results in a change of the light deflection angle small in comparison with the classical test; in the Kerr metric, the effect of massive body rotation, parameters of magnetic monopole, and dark energy are taken into account in addition to the vector potential. © 2012 Springer Science+Business Media New York.

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Keywords

aiming parameter, dark energy, fifth dimension, fifth velocity, general relativity theory, light deflection angle, reactive and electromagnetic potentials, variable mass